Attachment 2 – NTL 2000-N06

Deepwater Operations Plan Guideline

October 2000

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Deepwater Operations Plan Guideline

General

Description and Purpose

The purpose of the Deepwater Operations Plan (DWOP) is for the lessee (you) to provide sufficient information for the MMS to review the deepwater development project from a "total system" approach, emphasizing operational safety and environmental protection. Conservation issues are not part of the DWOP and should be addressed as part of the Supplemental POE or DOCD submittals (refer to Notice to Lessees and Operators (NTL) 2000-N05, "Conservation Information").

The DWOP benefits industry and MMS by providing an approval mechanism well in advance of significant spending. The DWOP also provides the early opportunity to describe and act upon any proposed methods of dealing with situations not specifically addressed in the regulations before they present a barrier to the project. The DWOP will provide MMS with information specific to deepwater/subsea equipment issues to demonstrate that a deepwater project is being developed in an acceptable manner as mandated in the OCS Lands Act, as amended, and 30 CFR 250 regulations.

Applicability

The DWOP is submitted for all non-conventional offshore facilities operating in over 1,000 feet water depth, and to all subsea developments, regardless of water depth. The DWOP may be written based on single or multiple surface systems, subsea wells, or on a field or reservoir group. Where multi-phased developments are anticipated, address components of each phase to the extent known at submission of the respective parts of the DWOP.

Definitions and Abbreviations

The Glossary at the end of this document lists key terms used in the DWOP Guideline. Refer to MMS regulations for the definition of other terms used in this guideline.

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Relationship to Other Submittals

The DWOP facilitates early submission of information that may be otherwise submitted in a project. To avoid duplication other submittals may be referred to in the following manner:

- **Previous Submittals -** The DWOP for a new field development may refer to previously submitted or approved document(s) for that field or development in lieu of duplicating that information. The reference should include Title, MMS Plan Control Number, District or Region office the document was submitted to, and date of approval, if any.

- **Changes to previously submitted or approved DWOP -** Related submittals that change or supersede information contained in the approved conceptual or preliminary DWOP will not require resubmission of that part. This updated information should be reflected in the next part of the DWOP to be submitted, and should reference the related submittal, as appropriate.

- **Approvals related to other developments -** When a DWOP would duplicate information previously approved by the MMS for a different development, the DWOP may refer to those approved portions in lieu of duplicating the submittal information.

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Submittal/ Approval Process

The DWOP is submitted to the MMS Regional Supervisor in three parts: Conceptual, Preliminary, and Final.

- **Conceptual Part -** The Conceptual Part addresses the general design basis and philosophy used to develop the field. This part provides an early opportunity for MMS and you to agree on a plan of development prior to major expenditures for engineering design. The Conceptual Part is submitted for approval after you have identified the concept(s) for development and prior to commencing with engineering design. A Conceptual Part is submitted for all projects requiring a DWOP.

- **Preliminary Part -** The Preliminary Part provides an opportunity for approval of the system and associated operations plan prior to major commitments and expenditures for hardware. It is submitted for approval after you have substantially completed system design and prior to commencing procurement and fabrication. Recognizing that various facets of the development require different lead times for procurement and fabrication, the Preliminary Part may be submitted in several different parts to suit the project schedule. In any case, obtain approval of the Preliminary Part prior to initiating production. For those subsea projects in less than 1,000 feet of water that are similar to previously approved projects, MMS may waive the requirement for a Preliminary Part.

- **Final Part -** The Final Part updates information previously submitted in the Preliminary or Conceptual Parts. This part is submitted for approval within 90 days following initial production.

- **Approval -** MMS will indicate its approval of each part in writing. As a guideline, MMS will approve each part within the following time schedule following receipt (assuming complete information has been provided with the submittal):
    - Conceptual Part - 30 Days
    - Preliminary Part - 90 Days
    - Final Part - 60 Days

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General, continued

Alternative Compliance/ Departures

The DWOP documents proposed alternative compliance with or departures from MMS regulations for the systems, subsystems or components identified in this Guideline. This description should include:

- Identification of the regulation and requirement for which alternative compliance is provided or departure is requested,
- Description of the alternative compliance provided or departure requested, and
- The reason, justification and supporting documentation for the alternative compliance or departure.

Revisions, Updates, and Amendments

The Conceptual, Preliminary or Final Part of the DWOP may require revisions or amendments for changes to development strategy. See the "Revisions, Updates and Amendments" section of this guideline for major modifications and amendments. For other changes, see "Relationship to other submittals" above for information contained in the DWOP and that is superseded or updated by other documents required by regulations.

Content of the Conceptual Part

The Conceptual Part identifies the concept(s) for field development and the basis for engineering design.

Location Plat

A plat showing the following:

1. Facility designation.
2. Lease number.
3. Area name.
4. Block number.
5. Surface system location including distance from nearest block lines.
6. Offset distances to any associated subsea development.

Overview

An overview of the development concept(s), including:

1. A description of the facility, including the following:
    a. Facility type and the key components of the system.
    b. Key design criteria.
    c. Corrosion protection system and inspection philosophy.
2. Description of the method of development (e.g., single satellite, clustered, multi-well configuration, number of wells, etc.).
3. Description of drilling/completion systems.
4. Description of pipeline and/or other offtake systems.
5. Description of drilling, production, and export riser systems.
6. Description of subsea control system.
7. The expected production stream composition.
8. Anticipated shut-in tubing pressure.
9. Special production situations.
10. Identification and a description of known hazards or unusual conditions. (The Plan of Exploration (POE) and/or the DOCD may be referenced for this information as applicable.)
11. Application of new technologies (e.g., design codes, materials, etc.).
12. Abandonment of the facilities, well(s), subsea structure(s), pipeline(s) and umbilical(s).

Well Identification

In the event that temporarily abandoned well(s) are being completed for production, the description should include:

1. The date the well(s) were drilled.
2. Reference of the specific lease and well identification.

Content of the Preliminary Part

The Preliminary Part describes changes to the development concept presented in the Conceptual Part. This part emphasizes any areas of the design, fabrication and installation of the system and/or components that incorporate new technologies or will require alternative compliance or departures.

Wellbore Information

A description and schematic of the typical wellbore, casing and completion, including:

1. Hole sizes.
2. Casing and tubing sizes, weights, grades, materials, etc.
3. Casing and liner depths.
4. Cement internal depths.
5. Anticipated casing shoe leak-off pressures.
6. SCSSV(s) setting depth and pressure rating.
7. Downhole chemical injection point(s).
8. Completion technique (e.g., cased-hole gravel pack, open-hole gravel pack, etc.).
9. Downhole monitoring (e.g., pressure, temperature).

Structural Information

The following items for the structural design, fabrication and installation of each of the surface system(s):

1. General description.
2. Design criteria and analysis procedures.
3. Structural design (steel and/or concrete).
4. Foundations.
5. Material, welding and fabrication.
6. Loadout, transport, and installation.
7. Inspection and in-service surveys.
8. Listing of other agencies, governments or classification societies providing certification(s).

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Content of the Preliminary Part, continued

Mooring System

The following items for the design, fabrication and installation of the mooring systems of the surface system(s):

1. General description.
2. Design criteria and analysis procedures.
3. Structural and mechanical design.
4. Foundations and anchors.
5. Material, welding and fabrication.
6. Installation.
7. Inspection and in-service surveys.

Station-keeping Systems

The following items for any active station-keeping system involving thrusters or other means of propulsion used with a surface system:

1. General description.
2. Design criteria.
3. Listing of other agencies, governments or classification societies providing certification(s).

Drilling and Completion Systems

The following items for the drilling and completion systems:

1. Description of rigs for drilling.
2. Shallow water or gas flow considerations and proposed method of addressing such hazards.
3. Extended reach, horizontal, and multi-lateral wells.
4. Special cementing operations.
5. Temporary well abandonment and re-entry program.
6. Workover and well servicing provisions.
7. Schedule of drilling/completion activities, including expected number of wells to be pre-drilled and conductors to be batch set.
8. Use of other than drill rigs to perform traditional rig functions.
9. Non-drilling related activities performed by drill rig.

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Content of the Preliminary Part, continued

Riser Systems

The following items for the design and fabrication of each of the riser system(s) (e.g., drilling, workover, production, and injection):

1. General description.
2. Design criteria and analysis procedures.
3. Structural and mechanical design.
4. Installation methods.
5. Inspection and in-service surveys.
6. Summary of safety and environmental controls.

Pipelines

The following items related to pipelines:

1. General description.
2. Location and route information.
3. Design criteria and analysis procedures.
4. Structural and mechanical design.
5. Installation methods.
6. Inspection and in-service surveys.
7. Summary of safety and environmental controls.

Vessel-based Offtake Systems

The following items for the design, fabrication and operation of an offtake system for transferring produced hydrocarbons to a transport vessel:

1. General description.
2. Design criteria.
3. Listing of other agencies, governments or classification societies providing certification(s).

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Content of the Preliminary Part, continued

Subsea Systems

This section applies to subsea wells and associated systems that constitute all or a part of a single project development covered by the DWOP. The following information:

1. General description.
2. Design criteria and analysis procedures.
3. Subsea structure(s) (e.g., template).
4. Fabrication and/or assembly/testing location of subsea components.
5. General mechanical flow diagram of the subsea production system in sufficient detail to support adequately the description of the test and operating procedures.
6. Subsea manifold(s) including:
    a. Pipe sizes, design pressure, and applicable design codes.
    b. Valves and means of actuation.
7. Christmas tree(s) and wellhead including:
    a. General assembly drawings and schematics with size and valve type annotations to illustrate the tree in production and workover modes.
    b. Identification of the underwater safety valve(s) (USV).
    c. Casing and tubing hangers.
8. Umbilical(s) and connection(s).
9. Chemical injection system.
10. Corrosion monitoring and prevention/inhibition provisions.
11. General mechanical flow diagram of equipment on a remote or host facility to support the subsea system.
12. A description of fire, gas detection, and vapor detection systems on a remote or host facility that protects equipment to support the subsea system.
13. A description of the methods, frequency and acceptance criteria for testing the USV(s), SCSSV(s), boarding SDV(s), and the function of the host facility ESD system and its interface to the subsea system.
14. A description of the process to determine static bottomhole pressure for the subsea well(s).
15. Inspection program.
16. Maintenance provisions.

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Content of the Preliminary Part, continued

Surface Production (Process) Equipment	A general description of surface production equipment. This may be in the form of a narrative or summary level diagrams. Identify the proposed fabrication, integration, and assembly locations of process equipment.
Emergency and Safety Systems	A description of the Surface/Subsea Safety System and Emergency Support Systems (ESS), including: 1. Interface between the surface and subsea systems (as applicable). 2. Interface between the drilling rig and the surface/subsea systems to support simultaneous drilling, completion, and/or workover operations and production operations. 3. Control system to execute Safety System and ESS shutdown of production and associated equipment (hydraulic power unit [HPU], chemical injection unit [CIU], and surface production equipment). 4. A description of the methods and frequency for testing of emergency shutdown systems that differ from the regulations.
Production Allocation Test	A description of the well production allocation test process.
Operating Procedures	A general description of the following operating procedures, including: 1. Managing or mitigating problems associated with produced fluids (e.g., paraffins, hydrates, corrosion, scale, etc.). 2. Handling of stored chemicals. 3. Startup and shutdown of subsea systems. 4. Simultaneous operations strategies. 5. Flaring and venting, including the expected volume and duration. 6. Remote well killing. 7. Through flowline (TFL) operations.

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Content of the Preliminary Part, continued

Installation and Commissioning /Testing	A description of the facility installation and commissioning procedure, including: 1. Description of operations that confirm the integrity of subsea systems. 2. Overview of surface systems commissioning procedures.
Hazard Analysis	A summary of the process(es) to identify, evaluate, and reduce the likelihood and consequences of uncontrolled hydrocarbon releases and other safety or environmental incidents, including: 1. Type and scope of analyses. 2. Qualification of participants. 3. Process for changes or follow-up actions generated by hazard analysis.

Content of the Final Part

The Final Part updates information submitted in the Conceptual and Preliminary Parts.

Cover Letter

A written statement from the lessee addressing adherence to the Preliminary Part of the DWOP.

Listing of Differences from Previous Parts

A listing of any areas where the final configuration or operations differs from that approved under the Preliminary Part, with appropriate supporting documentation.

1. Where the final configuration or operation impacts areas approved under other submittals (plans, applications, permits, etc.), you must resolve such issues under the affected submittal.
2. The Final Part of the DWOP may reference, but will not supersede, other required submittals.

Multi-Phased Development

For multi-phased development concepts, the Final Part should update as appropriate the status of future phases, and prognosis for proceeding to the next phase.

Revisions, Updates, and Amendments

Phased Developments	For projects that propose phased development beyond approval of the DWOP Final Part, MMS may require future updates or amendments to address project changes, milestones and achievements. Requirements for updates or amendments may be included in the final DWOP approval letter, or may be initiated by MMS if the you identify changes to the approved DWOP.
Major Modifications	Revisions to the DWOP are made for changes that materially alter the approved DWOP or cause a major deviation from approved operations.
Where Not Required	Changes to facility or development plan that do not require resubmission of the DWOP include: • **Process System Changes -** Revisions to processes, debottlenecking, or capacity improvements within the scope of the approved development strategy. Such modifications still require MMS approval. • **Changes Addressed Under Other Submittals -** Changes that may be addressed solely through the submission and approval of documents, plans or information required by regulation. (Refer to General Section, "Relationship to other submittals.")

Glossary

Alternative Compliance	Techniques, procedures, equipment, or activities other than those prescribed in the regulations and that afford a degree of protection, safety, or performance equal to or better than that intended to be achieved by the regulations.
APD	Application for Permit to Drill.
Deepwater	Water depths greater than 1,000 feet.
Departure	Techniques, procedures, equipment, or activities that deviate from the operating requirements of the regulations and that are necessary for facilitation of the proper development of the lease and afford an acceptable degree of protection, safety, or performance.
Flowline	Piping confined within a single platform or structure and that directs the wellstream from the wellhead to the first downstream process component. Piping not confined within a single platform or structure is considered to be a pipeline.
DOCD	Development Operations Coordination Document.
Host Facility	A surface facility that receives production from and provides utility and well control services for one or more subsea systems.
New Technology	Techniques, procedures, equipment and activities based on technology that has been used in only a limited capacity in the Gulf of Mexico OCS.
Non-Conventional Facility	A facility that employs floatation, new technologies, novel construction methods or materials. Examples include spars, tension leg platforms (TLP's), floating production systems (FPS's), floating production and storage and offloading systems (FPSO's), guyed towers, and compliant towers.

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Glossary, continued

OCS	Outer Continental Shelf.
Pipeline	Piping, risers, and appurtenances installed for the purpose of transporting oil, gas, sulfur, and produced waters between two separate facilities. This term also includes piping sometimes referred to as "flowlines," installed between subsea manifolds and a host facility.
POE	Plan of Exploration.
Riser Systems	Special piping systems, connections and appurtenances that comprise conduits between the seafloor and a surface system installed for the purpose(s) of (1) export, import or circulation of fluids; (2) guidance of drilling or workover tools to the well(s); or (3) support of auxiliary systems.
Simultaneous Operations	The conduct of drilling, completion, workover, wireline, pumpdown, or major construction operations at the same time and at the same location as producing operations, where such operation could increase the possibility of occurrence of undesirable events, such as harm to personnel or to the environment or damage to equipment.
Subsea System	Production components that are located on the seafloor and rely on a remote site or host facility for utility and well control services. Components may include wellheads, christmas trees, manifolds, control equipment, umbilicals, etc.
Surface System	A facility that involves floating hulls, gravity-based structures, floating facilities, guyed or compliant towers or other surface piercing systems for support of the deepwater development.
Total System Review	A review that encompasses both a regulatory and operational approach and that provides information about the interaction or effect of one system on the overall project design, safety, and performance.